

The listing of claims will replace all prior versions, and listings, of claims in the application:

OK TO
ENTER

Listing of Claims:

Gregg Cantelmo
5/29/07

1. (currently amended) An electrochemical device component, comprising:
an active metal electrode comprising lithium, the electrode having a first surface and a second surface;

a protective composite separator on the first surface of the electrode, the composite comprising,

GREGG CANTELMO
PRIMARY EXAMINER

a first material layer comprising a composite reaction product of Li with Cu_3N in contact with the electrode, the first material being ionically conductive and chemically compatible with the lithium active metal, ~~wherein the first material comprises a material selected from the group consisting of a composite reaction product of the active metal with a metal nitride, a composite reaction product of the active metal with silicon nitride, a composite reaction product of the active metal with a metal halide, a composite reaction product of the active metal with a metal phosphide, a reaction product of the active metal with red phosphorus, and a reaction product of the active metal with LiPON coated with a wetting layer; and~~

a second material layer in contact with the first layer, the second material being substantially impervious, ionically conductive, reactive to the lithium active metal and chemically compatible with the first material;

wherein the ionic conductivity of the composite is at least 10^{-7} S/cm.

2. (original) The component of claim 1, further comprising a current collector on the second surface of the active metal electrode.
3. (previously presented) The component of claim 1, wherein the second material is comprised in an electrolyte in a battery cell.
4. (previously presented) The component of claim 3, wherein the second material is the sole electrolyte in the battery cell.
5. (original) The component of claim 1, wherein the ionic conductivity of the second material layer is at least 10^{-7} S/cm.
6. (original) The component of claim 1, wherein the ionic conductivity of the second material layer is between about 10^{-6} S/cm and 10^{-3} S/cm.

10/686,189
PLUSP027

7. (original) The component of claim 1, wherein the ionic conductivity of the second material layer is about 10^{-3} S/cm.
8. (original) The component of claim 1, wherein the thickness of the first material layer is about 0.1 to 5 microns.
9. (original) The component of claim 1, wherein the thickness of the first material layer is about 0.2 to 1 micron.
10. (original) The component of claim 1, wherein the thickness of the first material layer is about 0.25 micron.
11. (original) The component of claim 1, wherein the thickness of the second material layer is about 0.1 to 1000 microns.
12. (previously presented) The component of claim 1, wherein the ionic conductivity of the second material layer is at least 10^{-7} S/cm and the thickness of the second material layer is about 0.25 to 1 micron.
13. (original) The component of claim 1, wherein the ionic conductivity of the second material layer is between about 10^{-4} about 10^{-3} S/cm and the thickness of the second material layer is about 10 to 500 microns.
14. (original) The component of claim 13, wherein the thickness of the second material layer is about 10 to 100 microns.
- 15-16. (canceled)
17. (original)) The component of claim 1, wherein the active metal of the electrode is lithium or a lithium alloy.
- 18-19. (canceled)
20. (previously presented) The component of claim 1, wherein the second layer comprises a material selected from the group consisting of phosphorus-based glass, oxide-based glass, sulfur-based glass, oxide/sulfide based glass, selenide based glass, gallium based glass, germanium based glass, glass-ceramic active metal ion conductors, sodium beta-alumina and lithium beta-alumina.
- 21-27. (canceled)
28. (original) The component of claim 1, wherein the second layer is an ion conductive glass-ceramic having the following composition:

10/686,189
PLUSP027

Composition	mol %
P ₂ O ₅	26-55%
SiO ₂	0-15%
GeO ₂ + TiO ₂	25-50%
in which GeO ₂	0--50%
TiO ₂	0--50%
ZrO ₂	0-10%
M ₂ O ₃	0 < 10%
Al ₂ O ₃	0-15%
Ga ₂ O ₃	0-15%
Li ₂ O	3-25%

and containing a predominant crystalline phase composed of $\text{Li}_{1+x}(\text{M}, \text{Al}, \text{Ga})_x(\text{Ge}_{1-y}\text{Ti}_y)_{2-x}(\text{PO}_4)_3$ where $X \leq 0.8$ and $0 \leq Y \leq 1.0$, and where M is an element selected from the group consisting of Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm and Yb and/or and $\text{Li}_{1+x+y}\text{Q}_x\text{Ti}_{2-x}\text{Si}_y\text{P}_{3-y}\text{O}_{12}$ where $0 < X \leq 0.4$ and $0 < Y \leq 0.6$, and where Q is Al or Ga.

29-79. (canceled)